



DESCRIPTION OF PREFERRED EMBODIMENT

The preferred embodiment embraces the system of my said copending application, now modified to incorporate the improvement of the current invention. These improvements, as before summarized, reside in the novel type and arrangement of accelerometer capacitances as additional input channels, as shown in Fig. 4; and the extension of the firmware processing performed in the microprocessor system to support the method of the invention, as flow-charted in Fig. 5. In addition, the static sensor channels have been increased in number and the associated sensors relocated to the corners with pairs of horizontally mounted coil springs now employed.

Fig. 1 depicts the force and torque sensing platform 5 in use as a computer touch input device for locating and otherwise measuring touches delivered to the display device 2, shown as a CRT display monitor 11. The touch force generated by the user's hand 1 at point P passes through CRT display monitor 2, then in parallel through a tilt-swivel base 3 and stabilizer bar and bracket 4 provided with platform device 5 to a top plate 7 and the

condition:

$$\underset{u}{f} = A \underset{u}{\ddot{f}} + B a . \quad (2$$

"C" is defined to be the six by twelve matrix formed by appending the rows of "B" after the corresponding rows of "A". There may be "n" measurement vectors in a calibration set collected as described.

Assume that a six by "n" matrix of uncorrected force readings " $\underset{u}{R}$ " is formed by taking the first six components (derived from 71, Fig. 5) of each measurement vector, in order, as a column of " $\underset{u}{R}$ ". Let twelve by "n" matrix of correction channel readings " $\underset{cc}{R}$ " be formed by taking the the last twelve components (derived from 72 and 73, Fig. 5) of each measurement vector, in order, as a column of " $\underset{cc}{R}$ ". Then we have:

$$\underset{u}{R} = C \underset{cc}{R} . \quad (3$$

In general, no "C" will exactly solve equation 3 -- it is inconsistently overdetermined, due to redundant but slightly noisy data. Yet many will very nearly do so, since "C" is at the same time underdetermined, in that some modes of disturbance are

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is obtained in a similar manner, except that zero is substituted for " $1/w$ " for each singular value " w "

While a serviceable value of "C" may often be obtained by using " W^{-1} " for " W_z^{-1} " in expression 6, use of the latter provides not only better average correction,

1. The first part of the document is a list of names and their corresponding addresses. The names are: John Doe, Jane Smith, and Bob Johnson. The addresses are: 123 Main St, 456 Elm St, and 789 Oak St.

--3. Apparatus for measuring force and/or torque to be applied to a mechanically movable or disturable system, including, where desired, objects associated therewith and portions of force measuring apparatus itself, having, in combination, means for sensing one or more

—8. Apparatus as claimed in claim 3 and in which the mechanically movable or disturbable system is a weighing system. —